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STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

Vol. II. NOVEMBER, 1921 No. 11

THE VALUE OF PERIODIC MEDICAL EXAMINATIONS.

For more than seven years the Metropolitan Life Insurance Company has made it possible for policy-holders in its Ordinary Department to obtain, without cost, a physical examination and the other health service offered by the Life Extension Institute. Between February, 1914, and July 31, 1921, this Company has authorized nearly 95,000 physical examinations through this agency. During this period the Company has expended in excess of $225,000 on this form of life conservation work. In order to discover the possible effect of these examinations upon the mortality of its policy-holders, Dr. A. S. Knight, Medical Director of the Company, studied the after history of the individuals who were examined during the first two years of the experiment, 1914 and 1915. A total of close to 6,000 persons was examined in those two years and their after history was observed up to November, 1920. This corresponded to an average period of five and one-half years per person. Up to the end of the observation period, there actually occurred 217 deaths among the examined persons. There should have been a total of 303 deaths if the mortality expected from persons of this class had actually occurred. There was a saving, therefore, of 28 per cent. in the mortality over a period of five years. This result was confirmed by independent investigation and the monetary value of the saving in mortality was calculated to be in excess of $126,000. From this amount must be subtracted the cost of the original and subsequent examinations made for this group of 6,000 policy-holders. The cost was approximately $40,000. It would appear, therefore, that the Company, on this particular group of policy-holders, had its principal returned and made a gain of about 200 per cent. on its investment during a period of approximately five years.

This however, was not the outstanding feature of the experiment. The important point to remember is that there has been a saving of life corresponding to 28 per cent. of the expected mortality in the short five-year period. It was to demonstrate the life-saving possibilities of such health work that this activity was begun. It has been established to the satisfaction of this Company that periodic medical examination is justified by the benefit in added life expectancy to the policy-holders examined. It is hoped that other agencies will see the value that follows from annual physical examinations and all that goes with that type of life conservation.

INCREASED CONSUMPTION OF SUGAR IN RELATION TO DIABETES INCIDENCE.

What is the probable effect of the increased consumption of sugars upon the incidence of diabetes? This question has occurred to a number of laboratory workers in the public health field as a result of the increase in the percentage of urines showing sugar reactions in routine life insurance examinations. Students of diabetes have shown that continued high blood sugar tends to act as a poison to certain of the pancreatic cells, that it tends to induce degeneration of these cells, and encourages the formation of fibrous tissue in the pancreas. Since the internal secretions from these particular cells of the pancreas are concerned with the utilization of sugar in the body, the diminution in the quantity of secretion tends to increase the quantity of sugar in the blood. The recent increase in the incidence of urines showing sugar is indicative, perhaps, of wider extension of damage to these pancreatic cells, and the supposition is that one may reasonably expect, with the passage of time, a corresponding increase in the number of persons showing diabetes mellitus.

There are various reasons assigned for the recent increase in the percentage of sugar reactions in life insurance medical examinations. The lower price of sugar and the increased consumption of sugars because of the restricted use of alcoholic beverages, have been suggested as causes. The use of malt beverages in which the fermentation of malt sugars is not complete, may have an influence also on our figures, because malt sugars are less readily utilized in the human body than are cane and fruit sugars.

These changes in the quantity and character of sugars in the diet of the American population will bear watching. According to the findings of one of the laboratories of the Metropolitan Life Insurance

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Company, in 1919, 6 per 1,000 of the urines examined showed positive sugar reactions; during the first nine months of 1921, the ratio was 11 per 1,000, a figure nearly double that for the year 1919. It was found, also, that nearly all of the increase in sugar incidence occurred with respect to small quantity reactions, that is, urines showing less than 0.75 per cent. of sugar in a specimen. It should be recalled that the quantity 0.75 per cent. is considerably greater than the normal. Normal fasting *blood* sugar should show a ratio of about 0.1 per cent.; following ingestion of carbohydrate food, the blood sugar percentage increases and the quantity may reach 0.15 or even 0.20 per cent. per specimen. Any excess of sugar over and above the normal percentage in the blood results in an overflow into the urine. Fortunately, there has been no significant increase as yet in the percentage of urines showing sugar reactions of 0.75 per cent. or above. Practically all of the increase has occurred for quantities of sugar less than this percentage per specimen. The chief cause for concern in the present situation is the possible effect of the prevailing high per capita consumption of sugar upon the pancreatic cells which regulate sugar utilization and consequently, upon the number of prediabetic and diabetic conditions which may develop in the future.

AN EXPLANATION OF THE INCREASED TYPHOID FEVER DEATH RATE FOR 1921.

The article on the increase in the typhoid fever death rate, given in our October BULLETIN, brought suggestions from a number of persons in widely separated parts of the country as to the reason for the higher death rate this year. It was suggested by these correspondents that the extraordinary deficiency in rainfall in certain parts of the United States for the first ten months of 1921 resulted in the drying up or shortage of water supplies of small communities and that, in order to relieve these conditions, communities resorted in a number of instances to water supplies of doubtful purity. In New York State, the State Engineer has been called upon frequently this year to use the emergency chlorinization outfit of the Department. In North Carolina, in certain parts of New Jersey, and in Maine and Ohio, there have been reported decided shortages of good water supply. The Secretary of the State Board of Health of Tennessee also reports that in a large number of instances private water supplies and some public supplies have played out entirely, and that consequently, the people of his state were compelled to use water from whatever source available. We are in-

formed by the United States Weather Bureau that for a group of representative stations there has been an average deficiency of 3.0 inches of rainfall this year under the computed normal. This deficiency has been more pronounced in the States east of the Mississippi River and on the Atlantic Coast than in other parts of the United States. The factor of diminished water supply seems, therefore, to contribute to the unexpected turn in the typhoid fever mortality rate this year. At such times, there should be more stringent laboratory observation of the purity of water supplies, the immediate chlorination of supplies found to be polluted; and antityphoid vaccination should be urged in communities where there is any likelihood of an extension of typhoid fever through public and private water supplies.

THE SAFETY FIRST CAMPAIGN MUST BROADEN ITS SCOPE.

The Safety First movement has so far been directed almost entirely toward the prevention of accidents. Its appeal, when so directed, is a popular one because people know a good deal about the causes of accidents and are generally ready to cooperate. But there is no good reason why the Safety First movement should be limited to accidents alone. There are five times as many deaths from the important preventable diseases as there are from preventable accidents. It is just as easy, moreover, to make a popular appeal that would bring about better public understanding of the dangers from disease, of their causes and of their mode of prevention as in the case of accidents. There is no good reason why the scope of the Safety First campaign should not be broadened to include the saving of life from disease as well as from accident. A very large return awaits the development of such an effort; for not less than one-third of the deaths are clearly preventable if the present facilities of knowledge and of service were availed of by the body of the people.

Why should not a Safety First campaign, for example, call attention to the danger to life from acute lobar pneumonia? This disease causes as many deaths as all accidents together. It is an infectious and, therefore, a preventable disease. The first step in fighting it is the reporting and isolation of all cases. Enforcement of such measures, to be thorough and effective, must have popular support and this may be obtained only as there is intelligent understanding on the part of the people of the danger of this disease and how to check it. It is well within the province of a Safety First

campaign at this time of the year when the lobar pneumonia death rate is increasing, to educate the public to the realization that this disease is the most deadly of the infections. The public has not as yet been taught to appreciate this fact, generally.

For the past two years the diphtheria situation has been very bad. From all over the United States and Canada come reports of increasing sickness and high mortality. It is well within the function of a Safety First campaign to teach the people that every child who dies of it dies needlessly; that the Schick test will indicate those who are susceptible to this disease; that inoculation with toxin-antitoxin will prevent a susceptible child from "taking" diphtheria.

Typhoid fever offers a good field for Safety First work. The cause of this disease is definitely known; so are the means by which it can be controlled. These methods of control can be explained in language as easily understood by the public as that which touches on the subject of prevention of automobile accidents, or accidental drownings.

The Safety First movement must widen its scope if it would serve the people as fully as it can.

RELATIVE IMMUNITY OF NEGROES TO CERTAIN DISEASES.

Although negroes have a higher general death rate than have whites, they enjoy a greater degree of immunity from a number of important diseases. The study of the facts may throw light on the nature of these diseases, on the processes of immunization and on the racial traits and tendencies of the colored people.

Negroes are relatively free from such important epidemic diseases as measles, scarlet fever and diphtheria. In the case of each, environmental conditions among negroes would lead us to expect them to have higher case and death rates than do the whites. But, as a matter of fact, the reverse is the rule. Negro children, wherever the facts have been studied, have fewer cases of these diseases and fewer deaths in proportion to the population exposed. The most reliable data are those for deaths. Among white children insured in the Industrial Department of the Metropolitan Life Insurance Company, for example, the death rate for measles for the ten-year period 1911 to 1920 was 8.9 per 100,000; for colored children the rate was only 4.8. For diphtheria, the figures for the same period are: white, 25.1; colored, 8.4. For scarlet fever, the death rates are:

white, 7.6 and colored, 1.6. The experience for the death Registration Area of the United States corresponds closely with these figures as does also that for a number of cities with large colored populations.

The report of Drs. Love and Davenport on the incidence of disease among white and colored troops, during the late war, shows very clearly that these diseases were much more frequently reported among white troops than among the colored. In addition to these three diseases, we find a record of relative immunity among the negroes for such conditions as yellow fever, erysipelas and cancer of the skin. These diseases share with the above the characteristic of having definite skin manifestations.

The group, as a whole, forms a considerable number of conditions in which negroes enjoy a greater immunity than do whites. Just what part the peculiarities of the negro skin play in bringing this immunity about is still an unsolved question. It has been suggested that the heavier pigmentation and more pronounced secretory activities of the sweat glands offer greater protection against these diseases than is found among the whites. This is a problem which will require further study.

With reference to the epidemic diseases noted above, it should be remembered that even though colored people have fewer cases of these conditions, they are prone to suffer more severely when they are attacked. In other words, the case fatality rates for some of these conditions, at least, are higher for the colored than they are for the whites. Their immunity consists in their racial capacity to resist infection rather than in a superior resistance to the ravages of these diseases when once attacked.

In addition to these diseases with skin manifestations, negroes appear to have greater immunity from attack from diseases which reflect metabolic disturbances. Diabetes is an example. In the ten-year period, 1911 to 1920, the death rate among Industrial policy-holders of the Metropolitan was 14.8 for whites and 11.1 for colored. Metabolic diseases are very definitely related to the stability of the nervous system and it is interesting in this connection to find Drs. Love and Davenport reporting that "The nervous system of uninfected negroes shows fewer cases of instability than that of the whites." In their investigations they recorded only about one-third as many cases of neurasthenia and constitutional psychopathic state; they recorded only one-half as much alcoholism in colored as in white troops. Functional defects of the heart of nervous origin were only about one-half as common in the camps among colored

as among white troops. They conclude that the negro has more stable nerves and metabolizes better. With reference to their observations about nervous conditions, it is interesting to study the death rates for locomotor ataxia. This disease is now generally recognized as a condition of syphilitic origin. Yet, the negro, who suffers with a death rate from syphilis at least three times that of the whites, actually has a lower mortality from this nervous manifestation of syphilis.

The racial differences of disease afford a very fruitful field for further investigation which should be cultivated by those who are located in those parts of the country where comparisons between the two races can best be made.

GROWTH OF THE REGISTRATION AREA FOR DEATHS AND BIRTHS.

The prospect for country-wide and satisfactory registration of births and deaths becomes brighter each year. This is shown clearly by a map recently issued by the Bureau of the Census for the year 1921. The map shows in distinctive colors the states already admitted to the Registration Area, those not yet admitted, but which have good registration laws, and those with unsatisfactory laws. Thirty-four of the 48 states and the District of Columbia are now within the Registration Area for deaths. The territory of Hawaii is also included. In 11 other states, satisfactory registration laws have been enacted and their effectiveness is being tested. As soon as evidence of the satisfactory working of these laws is forthcoming, these states will also be admitted. This leaves only the three states of Arizona, Nevada and South Dakota which "do not and cannot secure good registration of deaths" under existing laws. Even in these states remedial legislation is being considered.

Those familiar with the history of death registration in the United States can visualize a map of this kind relating to 1880, the year of the first "Registration Area." It comprised only two states, Massachusetts and New Jersey, the District of Columbia, and a few cities in other states. It covered only 17 per cent. of the population of Continental United States. In 1890, this percentage was raised to 31.4, in 1900 to 40.5, and in 1910, to 58.3. Now, nearly three-fourths of the states and 82.2 per cent. of the estimated population are under registration.

The prospect is undoubtedly encouraging. With only three states remaining with unsatisfactory laws, efforts of public health and

registration authorities can be concentrated, and there is good reason to believe that within a few years, the whole country will register the deaths of its people.

The birth registration situation is also encouraging. The movement is newer than that for death registration and the Area is smaller. Nevertheless, the Birth Registration Area has grown from 10 states in 1915 to 24 in 1921. This Area includes at present 65.1 per cent. of the population of the United States. Arizona, Nevada and South Dakota are again the only states which have not good registration laws.

HEALTH RECORD FOR OCTOBER 1921.

The death rate for October (7.7 per 1,000 Industrial policyholders) was the lowest for the year, to date, with the single exception of that for July. It was also very slightly below that for October of last year. The chief factor in bringing about this exceedingly favorable mortality condition was the low figure for tuberculosis. The death rate for all forms of tuberculous disease was 95.3 per 100,000. This is not only the lowest rate of the year, but marks the minimum for this disease for any month in the history of the Industrial Department of this Company. All the causes of death which are usually most important numerically, continue to register remarkably low death rates, with the single exception of cancer. The mortality from puerperal conditions has been improving for several months; in fact, there has been a continuous decrease since June. It is encouraging to note that this improvement has been observed for puerperal septicemia as well as for the other diseases incidental to the maternal state. Earlier in the year, the improvement did not include septicemia, which for a number of months actually showed a death rate higher than for last year.

Diphtheria continues to be the outstanding bad spot in the public health situation. The mortality from this disease has been excessive now for practically two years. Month after month improvement has been hoped for, but the very few favorable fluctuations in the death rate have proved to be only temporary. Now for the month of October we are confronted with a diphtheria rate (27.4 per 100,000) which is higher than has been recorded for any month of 1921, with the single exception of January. As the remaining months of the year are usually periods of comparatively high mortality from this disease, early improvement in the situation can hardly be expected.

The rates for both suicide and homicide were higher in October than in September. There was a slight decline in the figure for automobile accidents, but for 1921, to date, the automobile accident death rate in the Industrial Department of the Metropolitan remains even higher than for the same ten months of last year.

In the general population of the large cities the public health situation, as a whole, remained favorable during October. The death rate was 11.1 per 100,000 population. This is a little higher than the rate for September, but is identical with that of October, 1920. As indicated in our reports for the Industrial policy-holders, the diphtheria situation was also the most unfavorable item in the general population health record. This disease was especially prevalent in Illinois, Kansas, Indiana, North Carolina, New York, Missouri, Minnesota and Massachusetts. In Kansas City, Missouri, 156 cases were reported within a period of three weeks. A large quantity of toxin-anti-toxin was distributed to physicians in Kansas City, Kansas, to forestall the spread of the epidemic. The diphtheria situation during the month has been presenting serious aspects, also, in Leavenworth and Wichita, Kansas; Minneapolis, Minnesota; Elkins, West Virginia; Billings, Missouri; Blackford County, Indiana; Barrington, New Jersey; Monon, Indiana, and other points. In Minneapolis, the Health Commissioner appointed medical inspectors to assist private physicians in making diagnoses of diphtheria suspect cases. With more than 150 cases in the city this action was considered necessary to prevent the further spread of the disease. There has also been an increase during October in the prevalence of scarlet fever. The following states report the largest number of cases: Illinois, Kansas, New York, Missouri, Indiana, Wisconsin, North Carolina and Minnesota. Early in the month a scarlet fever epidemic prevailed in Cumberland, Maryland, and there were serious outbreaks in a number of places in Westchester County, New York. There was a marked increase in the disease in the last week of October in Wichita, Kansas. The situation in Springville, Ohio, was such as to virtually cut off this village of twenty families from outside communication.

Smallpox was encountered during October in larger numbers of cases over wider areas. A Pennsylvania order decreed that all school children must be examined for scars of successful vaccination. In Kansas City, Missouri, employers were served notice to see that their employees complied with the vaccination order of the Health Board. In Haddonfield, New Jersey, all schools were closed, general

vaccination prevailed and a ban was placed on all public gatherings. The health authorities of the town believe that the disease was brought in from the Southern states. In Fremont, Ohio, also, the smallpox situation necessitated the closing of schools as well as the theaters and churches. In a college at Bethlehem, Pennsylvania the entire student body and faculty underwent vaccination. In Oklahoma City, Oklahoma, 125 cases of smallpox had been reported between January 1 and October 5 of this year.

Poliomyelitis was most prevalent in Illinois, New York, Washington, Minnesota and Maryland. These states have reported a large number of cases during the last three months. There was also an outbreak of this disease in Shelton, Nebraska. Here, the situation prompted the Board of Health to issue an order placing a ban on all public gatherings.

The following states report the largest number of typhoid fever cases: New York, New Jersey, Illinois, Maryland, Kentucky, Kansas, Georgia, Alabama and North Carolina. With a few exceptions, all states for which figures are available, showed more typhoid cases than reported during September. Several cases in St. Charles Township, Kane County, Illinois, resulted from impure milk served by a dairy farm which also furnishes milk to Chicago. A severe outbreak in that city was averted, probably, by the fact that all milk sold in Chicago is pasteurized. In the October report of the Instructive District Nursing of Boston, typhoid was said to be especially prevalent in that city.

Lethargic encephalitis has been reported during the month from California, Massachusetts, Maryland, Nebraska, New York, Illinois, Kansas, Maine and Louisiana.

There is evidently no improvement with respect to the general situation for automobile fatalities. Reports from many parts of the country indicate this. In New York State, 231 persons were killed during October; 88 of these deaths were in New York City.

The table below gives the mortality data among Industrial policy-holders for October and September, 1921, for October, 1920, and for the year 1920:

METROPOLITAN LIFE INSURANCE COMPANY.

Death Rates per 100,000 for Principal Causes, Premium-paying Business in Industrial Department.

(Annual Basis)

MONTHS OF SEPTEMBER AND OCTOBER, 1921 AND OF OCTOBER, 1920.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED			
	Oct., 1921	Sept., 1921	Oct., 1920	Year 1920
TOTAL—ALL CAUSES	770.8	791.6	801.1	989.4
Typhoid fever	8.4	13.6	10.7	6.7
Measles	.3	.5	1.2	8.5
Scarlet fever	3.4	3.3	2.7	6.0
Whooping cough	1.3	3.6	4.9	6.6
Diphtheria	27.4	17.7	22.3	22.1
Influenza	3.6	2.9	5.7	53.5
Tuberculosis (all forms)	95.3	100.5	116.2	137.9
Cancer	69.5	72.2	72.5	69.8
Meningitis (all forms)	4.0	4.7	4.4	5.2
Cerebral hemorrhage	52.7	52.2	51.0	61.3
Organic diseases of heart	107.8	98.3	95.0	117.0
Pneumonia (all forms)	39.4	32.7	38.3	106.1
Other respiratory diseases	11.8	11.5	12.2	18.2
Diarrhea and enteritis	14.7	24.2	22.4	15.8
Bright's disease	62.2	63.6	62.2	70.8
Puerperal state	14.1	15.9	17.3	23.0
Suicides	8.4	7.9	6.9	6.1
Homicides	6.6	5.8	6.5	5.8
Other external causes (excluding suicides and homicides)	49.9	60.5	57.0	60.1
Traumatism by automobile	13.8	14.1	14.0	11.1
All other causes	190.0	200.2	191.6	188.9

Correspondence on the subjects discussed in these BULLETINS may be addressed to the Editor:

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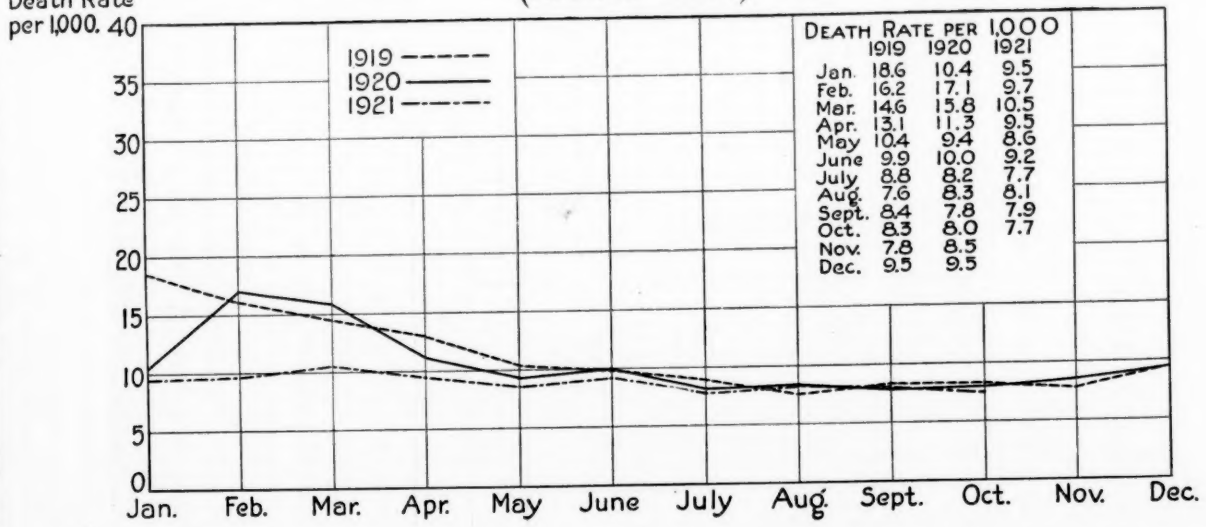
Metropolitan Life Insurance Co.

INDUSTRIAL DEPARTMENT

Death Rate per 1,000 in Specified Months of 1919, 1920, 1921.

(ANNUAL BASIS)



DEATH RATE PER 1,000	1919	1920	1921
Jan.	18.6	10.4	9.5
Feb.	16.2	17.1	9.7
Mar.	14.6	15.8	10.5
Apr.	13.1	11.3	9.5
May	10.4	9.4	8.6
June	9.9	10.0	9.2
July	8.8	8.2	7.7
Aug.	7.6	8.3	8.1
Sept.	8.4	7.8	7.9
Oct.	8.3	8.0	7.7
Nov.	7.8	8.5	
Dec.	9.5	9.5	